Applicant: Michael Kowalchik, *et al.*
U.S.S.N.: 10/731,622
Filing Date: December 9, 2003
EMC Docket No.: EMC-01-102CIP1

REMARKS

In response to the final Office Action mailed June 17, 2005, applicants respectfully request reconsideration. In the final Office Action, claims 30-32, 34-43, 45 and 47-50 were rejected. Based on the foregoing, the rejections are respectfully traversed.

Finality of Rejection

Applicant respectfully asserts that the finality of the outstanding Office Action is improper. As set forth in MPEP §706.07(a), "[a] second or subsequent action on the merits in any application ... *should not be made final* if it includes a rejection, on prior art not of record, of any claim amended to include limitations which should reasonably have been expected to be claimed." (Emphasis added).

First, the Rao patent (5,845,104) was not prior art of record prior to the outstanding Office Action. Second, applicants' amendments in the previous response only added limitations that were in dependent claims into the respective independent claims. Therefore, the independent claims were amended to include limitations which should reasonably have been expected to be claimed. In fact, the limitations actually *were claimed*, in the dependent claims.

Therefore, since the prior art relied upon in the outstanding Office Action was not prior art of record and the claims were amended to include limitations which not only should reasonably have been expected to be claimed, but were actually claimed, the finality of the Office Action is improper and should be withdrawn.

Claim Rejections Under 35 U.S.C. §103

Claims 30-32, 34-43 and 47-50 were rejected under 35 U.S.C. §103(a) as being unpatentable over by Brandt et al. in view of Rao (U.S. Patent No. 5,845,104). The examiner states that, although Brandt does not teach non-volatile memory devices, Rao does, and therefore, it would have been obvious to utilize the flash memory of Rao in the system of Brandt. This rejection is respectfully traversed, as not only does Brandt teach against the combination

suggested by the examiner, but the combination suggested by the examiner does not teach the invention recited in independent claim 30.

Independent claim 30 recites a data storage device comprising:

a device interface for receiving data access requests;

a device housing conforming to a standard form factor;

a plurality of non-volatile memory devices housed within the device housing, the plurality of non-volatile memory devices being selected from the group consisting of flash memory; compact flash memory; magnoresistive RAM; ferroelectric RAM; dynamic RAM and static RAM being maintained as non-volatile with the use of a power subsystem and microelectromechanical memory devices; and

a controller that accesses the non-volatile memory devices in response to the received data access requests.

As set forth in applicants' previous response, Brandt does not teach a plurality of non-volatile memory devices housed within the device housing, the plurality of non-volatile memory devices being selected from the group consisting of flash memory; compact flash memory; magnoresistive RAM; ferroelectric RAM; dynamic RAM and static RAM being maintained as non-volatile with the use of a power subsystem and microelectromechanical memory devices.

Brandt specifically teaches disk drives in his cache interfacing system and repeatedly refers to the advantages of disk drives such as the low cost and wide availability of disk drives. In fact, Brandt specifically *teaches away* from using any type of memory other than disk drives. In Column 6, lines 3-12, Brandt states that his system "is an improvement over directly coupling host 10 to the high volume data storage subsystem 25, or using a solid state type device, such as caching through the use of a RAM for such interfacing." Brandt states that, with this approach, "the high cost of solid state interfacing is significantly avoided by a large margin...." Accordingly, Brandt teaches away from utilizing any type of flash, RAM or other type of solid state memory that is not a disk drive.

Accordingly, applicants assert that the 35 U.S.C. §102 rejection of amended independent claim 30 is improper and that amended independent claim 30 is allowable over the cited art of

record. Applicants therefore respectfully assert that the 35 U.S.C. §102 rejection of independent claim 30 be withdrawn.

Claims 31 and 35-42 depend from independent claim 30 and are allowable for at least the same reasons as independent claim 30.

Amended independent claim 43 recites a data storage system comprising:

at least one first data storage device having a platter size of at least 3.5 inches in diameter;

at least one second data storage device comprising:

a device interface for receiving data access requests;

a device housing conforming to a standard form factor;

a plurality of non-volatile memory devices housed within the device housing, the plurality of non-volatile memory devices being selected from the group consisting of flash memory; compact flash memory; magnoresistive RAM; ferroelectric RAM; dynamic RAM and static RAM being maintained as non-volatile with the use of a power subsystem and microelectromechanical memory devices; and

a first controller configured to receive data access requests from the device interface; and

a second controller that coordinates data access to the at least one first data storage device and the at least one second data storage device.

As set forth above, Brandt does not teach a plurality of non-volatile memory devices housed within the device housing, the plurality of non-volatile memory devices being selected from the group consisting of flash memory; compact flash memory; magnoresistive RAM; ferroelectric RAM; dynamic RAM and static RAM being maintained as non-volatile with the use of a power subsystem and microelectromechanical memory devices.

Brandt specifically teaches disk drives in his cache interfacing system and repeatedly refers to the advantages of disk drives such as the low cost and wide availability of disk drives. There is absolutely no reference in Brandt that any other type of memory device may be used in his cache interfacing system.

Accordingly, applicants assert that the 35 U.S.C. §102 rejection of amended independent claim 43 is improper and that amended independent claim 43 is allowable over the cited art of

record. Applicants therefore respectfully assert that the 35 U.S.C. §102 rejection of independent claim 43 be withdrawn.

Amended independent claim 45 recites a method of servicing data access requests at a data storage device, the method comprising:

receiving data access requests at a device interface of the data storage device; and

accessing a plurality of non-volatile memory devices housed within a standard form factor device housing in response to the received data access requests, the plurality of non-volatile memory devices being selected from the group consisting of flash memory; compact flash memory; magnoresistive RAM; ferroelectric RAM; dynamic RAM and static RAM being maintained as non-volatile with the use of a power subsystem and microelectromechanical memory devices.

Again, Brandt does not teach every element recited in independent claim 50. Since Brandt specifically teaches disk drives in his cache interfacing system and repeatedly refers to the advantages of disk drives such as the low cost and wide availability of disk drives and because there is absolutely no reference in Brandt that any other type of memory device may be used in his cache interfacing system, applicants assert that the 35 U.S.C. §102 rejection of amended independent claim 45 is improper and that amended independent claim 45 is allowable over the cited art of record. Applicants therefore respectfully assert that the 35 U.S.C. §102 rejection of independent claim 45 be withdrawn.

Amended independent claim 47 recites a data storage device comprising:

a device interface for receiving data access requests;

a plurality of non-volatile memory devices, the plurality of non-volatile memory devices being selected from the group consisting of flash memory; compact flash memory; magnoresistive RAM; ferroelectric RAM; dynamic RAM and static RAM being maintained as non-volatile with the use of a power subsystem and microelectromechanical memory devices; and

a controller that accesses the non-volatile memory devices in response to the received data access requests;

wherein the controller comprises a controller configured to implement a RAID scheme.

Again, Brandt does not teach every element recited in independent claim 50. Since Brandt specifically teaches disk drives in his cache interfacing system and repeatedly refers to the advantages of disk drives such as the low cost and wide availability of disk drives and because there is absolutely no reference in Brandt that any other type of memory device may be used in his cache interfacing system, applicants assert that the 35 U.S.C. §102 rejection of amended independent claim 47 is improper and that amended independent claim 47 is allowable over the cited art of record. Applicants therefore respectfully assert that the 35 U.S.C. §102 rejection of independent claim 47 be withdrawn.

Claim 48 depends from independent claim 47 and is allowable for at least the same reasons as independent claim 47.

Amended independent claim 49 recites a data storage device comprising:

a device interface for receiving data access requests;

a plurality of non-volatile memory devices; and

a controller that accesses the non-volatile memory devices in response to the received data access requests;

wherein the plurality of non-volatile memory devices include at least one of flash memory; compact flash memory; magnoresistive RAM; ferroelectric RAM; any type of volatile memories, such as dynamic and static RAM, maintained as non-volatile with the use of a power subsystem; and microelectromechanical memory devices.

Again, Brandt does not teach every element recited in independent claim 50. Since Brandt specifically teaches disk drives in his cache interfacing system and repeatedly refers to the advantages of disk drives such as the low cost and wide availability of disk drives and because there is absolutely no reference in Brandt that any other type of memory device may be used in his cache interfacing system, applicants assert that the 35 U.S.C. §102 rejection of amended independent claim 49 is improper and that amended independent claim 49 is allowable over the cited art of record. Applicants therefore respectfully assert that the 35 U.S.C. §102 rejection of independent claim 49 be withdrawn.

Amended independent claim 50 recites a data storage device comprising:

a device interface for receiving data access requests;

a plurality of non-volatile memory devices, the plurality of non-volatile memory devices being selected from the group consisting of flash memory; compact flash memory; magnoresistive RAM; ferroelectric RAM; dynamic RAM and static RAM being maintained as non-volatile with the use of a power subsystem and microelectromechanical memory devices; and

a controller that accesses the non-volatile memory devices in response to the received data access requests;

wherein the controller is configured to access the non-volatile memory devices in a manner that emulates access to a single disk drive.

Again, Brandt does not teach every element recited in independent claim 50. Since Brandt specifically teaches disk drives in his cache interfacing system and repeatedly refers to the advantages of disk drives such as the low cost and wide availability of disk drives and because there is absolutely no reference in Brandt that any other type of memory device may be used in his cache interfacing system, applicants assert that the 35 U.S.C. §102 rejection of amended independent claim 50 is improper and that amended independent claim 50 is allowable over the cited art of record. Applicants therefore respectfully assert that the 35 U.S.C. §102 rejection of independent claim 50 be withdrawn.

Claim Rejection Under 35 U.S.C. §103

Claim 34 was rejected under 35 U.S.C. §103(a) as being unpatentable over Brandt in view of Eckerd. This rejection is respectfully traversed.

Claim 34 depends from amended independent claim 30 which, as set forth above is allowable over the art of record. Accordingly, claim 34 is allowable for at least the same reasons as independent claim 30. Therefore, the rejection of claim 34 under 35 U.S.C. §103(a) is improper and should be withdrawn.

Double Patenting

Claims 30-50 were provisionally rejected under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3, 14-16 and 18-20 of copending Application No. 10/004,090. This provisional rejection is respectfully traversed.

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Based on the amendments to independent claims 30, 43, 45, 49 and 50, applicants assert that the claims are patentably distinct from the claims in copending Application No. 10/004,090 and are therefore allowable.

Amendment to the Specification

Applicants have amended the specification to include amendments made to the specification in the parent application.

In view of the foregoing amendments and remarks, the applicants assert that claims 30-32, 34-43, 45 and 47-50 are allowable and respectfully request favorable reconsideration.

In the event the Examiner deems personal contact desirable in the disposition of this case, the Examiner is invited to call the undersigned attorney at (508) 293-7835.

Please charge all fees occasioned by this submission to Deposit Account No. 05-0889.

Respectfully submitted,

Dated: 10/19/05

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